

## **Bariatric Surgery in Childhood: too Soon to Tell?**

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**Keywords:** *bariatric, adolescent, childhood, morbid obese*

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### **1. INTRODUCTION**

This editorial is an annotation on the debatable subject of bariatric surgery in morbid obese children and adolescents.

The obesity pandemic is escalating worldwide to a point that it is often described as “globesity”. Simultaneously, the increasing proportion of obese population includes a growing prevalence of morbid obesity in younger people [1]. The introduction of bariatric surgery as a treatment option for obesity has been manifested with radical changes in the overall approach towards this condition. As a consequence, a debatable issue arises regarding the eligibility of obese adolescents for bariatric procedures [2].

It has been well documented that obesity during childhood is associated with higher risk of developing adult obesity (“juvenile onset” obesity) and it is often associated with specific comorbidities related to enhanced aging pace, such as type 2 diabetes mellitus (DM2), obstructive sleep apnea, nonalcoholic fatty liver disease (NAFLD), dyslipidemia, hypertension, pseudotumor cerebri and eating disorders [2]. Additionally, it can have great impact on the quality of life (QoL) of children and even lead to depression [2].

Currently there is a variety of surgical procedures that are available for children and adolescents. However, long-term effects from high quality studies are scarce [3, 4]. Furthermore, when the surgeon has to take the call to put an underage on the surgical table because he/she is “too obese”, what should that person take into consideration? Should the surgeon estimate how much the excess weight is and primarily take into account the body mass index (BMI)? But BMI is not indicative of the excess weight of a non-adult [5]. Should the surgeon take percentiles of height curves then to be the primary criterion for surgery? However, what happens when the existing comorbidities are disproportionately high compared with the excess weight?

### **2. GUIDELINES AND RECOMMENDATIONS**

In an effort to elucidate these indistinct borders between “yes” or “no” to the aforementioned questions, the American Society for Metabolic and Bariatric Surgery (ASMBS) Pediatric Committee published guidelines in 2012 [2].

ASMBS recommendations for adolescents, as appropriate candidates for bariatric surgery, include the following selection criteria: BMI > 35kg/m<sup>2</sup> with major comorbidities (i.e., DM2, sleep apnea with apnea-hypopnea index > 15, pseudo tumor cerebri, severe NAFLD) or BMI > 40kg/m<sup>2</sup> with other comorbidities (e.g., hypertension, insulin resistance, glucose intolerance, substantially impaired quality of life or activities of daily living, dyslipidemia, sleep apnea with apnea-hypopnea index >5) [2]. One rash and simplified assumption of these criteria could label them as “the same as for adults”. However, further interpretation of the BMI values suggests that the BMI cutoff point adjusts to a more conservative approach, since average BMI and age are increasing in parallel [5].

Nonetheless, three years following the publication of these guidelines, new position statements were developed by the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition in January, 2015. In these guidelines, there is tendency towards a less aggressive approach for adolescent with morbid obesity. More specifically, the cutoff BMI is increased at 40 kg/m<sup>2</sup> with major comorbidities and at 50 kg/m<sup>2</sup> with minor ones [6].

In both cases, Roux En Y gastric bypass (RYGB) is acknowledged as the most preferable one. It is stated that laparoscopic adjustable gastric banding and sleeve gastrectomy should be both considered investigational. There is a number of studies showing results of bariatric operations in children to be comparable or even better than those seen in adults [7]. One could wonder why propose even stricter criteria for eligibility of adolescents in bariatric surgery, despite its stated effectiveness. There are certain key points that can guide us through this phenomenal irrationality.

### 3. LESS AGGRESSIVE, WHY?

First of all, complications. Children are not in danger of intraoperative complications compared with obese adults, since their organism has not been exposed to the deteriorating effect of obesity for a long time. However, what is more concerning, are the post-operative complications and mainly the long-term ones. RYGB, which is considered the gold standard among the rest bariatric procedures, is both a restrictive and malabsorptive surgery. As a result, the child will have to be under strict and frequent supervision follow up regarding the macro- and micro- nutrient ingestion and absorption issues from its diet or from dietary supplements. Growth patterns must be monitored and kept at near normal post-surgically. Additionally, adolescents having bariatric surgery already bear the burden of an abdominal surgery, which can increase the risk of complications of other surgeries in later life.

Secondly, long-term effectiveness. It is yet to be proven how permanent the outcomes of a bariatric surgery are in younger age. The organism is still developing, so the stability of alternations in the anatomy and physiology cannot be precisely foreseen. However, the most important factor that should be of concern to the physician is the behavioral adaption of the child to its postoperative life. The young patient has to deal with a number of challenges regarding changes in his/her dietary habits, ongoing medical supervision, possible side effects of the surgery and last but not least his/her own psychology. Depression and eating disorders are frequently a characteristic of super obese adolescents [8]. On a short term basis after the operation, the former seems to ameliorate while the latter does not seem to adversely affect the weight loss outcome [9, 10].

Another point to consider is the insurance coverage. There are still no specific and clarified guidelines regarding the indications of bariatric surgery in non-adult population. The term “non-adult population” is used because even the position statement of the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition was unable not define an age threshold [6]. As a consequence, it is imperative to conclude to specified guidelines so that the coverage of these procedures can be justified by the policy of the insurance companies.

Additionally, there is another point of view that cannot be omitted and this is cost-effectiveness. It is high yield to determine if an intervention in such a young age is going to bear more profits than burdens. The total cost of the bariatric surgery (complications, follow-up, and recurrence) has to be estimated and compared with this of conservative approach and its potential cost due to diminished control of morbid obesity and its comorbidities.

Furthermore, it is suggested that instead of performing a surgery, physicians should initially focus on alternative less invasive procedures such as non-surgical temporary balloon device which recently took Food and Drug Association approval for obese adult patients with a BMI of 30 to 40kg/m<sup>2</sup> [6].

One last remarkable point is the following question: Should a surgeon perform bariatric surgery on a child or adolescent if their parents are obese too? In this case, the child is exposed to epigenetic factors if the obesity of its parents existed before its birth and to “environmental” factors with refer to obesity within the family [11]. Consequently, the dilemma consists of two sides; is the child an appropriate candidate for surgery because of its “double exposure” to obesity and thus a more eradicated solution is required or this background is non-fertile for the desired outcomes of bariatric surgery?

### 4. CONCLUSION

To put it all in a nutshell, the initial enthusiasm of bariatric surgery in childhood has diminished recently and a more conservative approach seems to be preferred. This “wait and act” tactic may be the most appropriate strategy for this age group since their organism is still “under development”. Thus, better understanding of the interacting mechanisms between the constant changes of hormones and emotional status, and how these may influence the outcome of the above mentioned surgery, is required. Future perspective of this statement includes the design and processing of longitudinal studies of childhood and adolescents population until their adulthood.

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